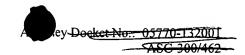


## What is claimed is:

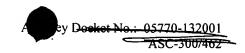
zirconia.

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			)
B	1	1.	A multi-layer high temperature superconductor, comprising:
γν 20	2		a first high temperature superconductor coated element, comprising:
	B		a first substrate;
	4		at least one first buffer deposited on the first substrate;
	5		at least one first high temperature superconductor layer; and
	6		a first cap layer; and
	7		a second high temperature superconductor coated element, comprising:
	8		a second substrate;
	9		at least one second buffer deposited on the second substrate;
	10		at least one second high temperature superconductor layer; and
	11		a second cap layer;
<b>C</b> :1	12		wherein the first and second high temperature superconductor coated elements are joined
	13		at the first and second cap layers.
	1	2.	The superconductor of claim 1, wherein the first substrate is biaxially textured.
	•	۷.	The superconductor of claim 1, wherein the first substrate is braxially textured.
	1	3.	The superconductor of claim 2, wherein the biaxial texturing is by deformation texturing.
	1	4.	The superconductor of claim 3, wherein the first substrate comprises nickel.
	1	5.	The superconductor of claim 4, wherein the first substrate comprises nickel-chromium,
	2		nickel-copper, or nickel-vanadium alloys.
	1	6.	The superconductor of claim 5, wherein the first substrate comprises a nickel-chromium
	2		alloy.
	1	7.	The superconductor of claim 2, wherein the at least one first buffer is epitaxially
	2		deposited.
	1	8.	The superconductor of claim 1, wherein the at least one first buffer comprises metal
	2		oxides.
	1	9.	The superconductor of claim 8, wherein the metal oxides comprise cerium oxide and
	2		gadolinium oxide.
	1	10.	The superconductor of claim 8, wherein the first buffer further comprises yttria stabilized



- 1 11. The superconductor of claim 1, wherein at least two buffers are sequentially deposited on the first substrate.
- 1 12. The superconductor of claim 11, wherein three buffers are sequentially deposited on the first substrate.
- 1 13. The superconductor of claim 1, wherein the first high temperature superconductor layer comprises metal oxide.
- 1 14. The superconductor of claim 1, wherein the first high temperature superconductor layer comprises rare earth oxides.
- The superconductor of claim 14, wherein the rare earth oxides have the formula
  (RE)Ba<sub>2</sub>Cu<sub>3</sub>O<sub>7-δ</sub>, wherein RE is selected from the group consisting of rare earth elements
  and yttrium, and δ is a number greater than zero and less than one.
- 1 16. The superconductor of claim 1, wherein the first cap layer is deposited on the first high temperature superconducting layer.
- The superconductor of claim 1, wherein the first and second substrates are of substantially identical composition.
  - 1 18. The superconductor of claim 1, wherein the first and second buffers are of substantially identical composition.
  - 1 19. The superconductor of claim 1, wherein the first and second high temperature superconducting layers are of substantially identical composition.
  - 1 20. The superconductor of claim 1, wherein the first and second cap layers are of substantially identical composition.
  - 1 21. The superconductor of claim 1, wherein the first and second high temperature superconductor coated elements are of substantially identical composition.
  - 1 22. The superconductor of claim 1, wherein the first and second cap layers are continuously joined at their uppermost surfaces.
  - 1 23. The superconductor of claim 1, wherein the first and second cap layers are a single continuous layer.



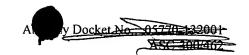
1 24. The superconductor of claim 1, wherein the superconductor is in the form of a tape. The superconductor of claim 1, wherein the substrates are substantially untextured, and 25. 2 the buffers and high temperature superconductor layers are biaxially textured. 3 26. The superconductor of claim 24, wherein the first and second high temperature 1 superconductor coated elements are registered at their respective edges. 2 27. The superconductor of claim 24, wherein the first and second high temperature 1 2 superconductor coated elements are offset along their lengths. 28. 1 The superconductor of claim 27, wherein at least one of the first and second cap layers extends along the edge of at least the first and second high temperature superconductor 2 coated element. 3 29. The superconductor of claim 1, wherein the superconductor comprises a multifilamentary 1 <u>\_\_\_</u>2 structure. د 1]] 3 30. The superconductor of claim 29, wherein the first and second high temperature ٠...**4** superconducting layers are divided into a plurality of filaments. <sup>--</sup>5 31. The superconductor of claim 1, further comprising a stabilizer, wherein the first and second cap layers are joined to opposing surfaces of the stabilizer. ₅ 6 4-إينز 32. A multi-layer high temperature superconductor, comprising: a first high temperature superconductor coated element, comprising: <u>:</u>]3 a first substrate; at least one first buffer deposited on the first substrate; at least one first high temperature superconductor layer; and 5 a first cap layer; and 6 7 a second high temperature superconductor coated element, comprising: a second substrate: 8 at least one second buffer deposited on the second substrate; 9 at least one second high temperature superconductor layer; and 10 a second cap layer; 11

with an intervening metallic layer.

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wherein the first and second high temperature superconductor coated elements are joined



14	33.	A multi-layer high temperature superconductor, comprising:
15		a first high temperature superconductor coated element, comprising:
16		a first substrate;
17		at least one first buffer deposited on the first substrate; and
18		at least one first high temperature superconductor layer, and
19		a second high temperature superconductor coated element, comprising:
20		a second substrate;
21		at least one second buffer deposited on the second substrate; and
22		at least one second high temperature superconductor layer;
23		wherein the first and second high temperature superconductor coated elements are joined
24		with an intervening metallic layer.